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PRELIMINARY FINDINGS FROM A LONGITUDINAL EDUCATIONAL IMPROVEMENT PROJECT BEING CONDUCTED FOR INSTRUCTIONALLY IMPOVERISHED PUPILS IN INTACT SCHOOLS IN THE URBAN SOUTH.

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A STUDY WAS CONDUCTED TO FIND OUT WHETHER OR NOT A SIGNIFICANT CHANGE IN PUPILS' ACADEMIC POTENTIAL (AS MEASURED BY A STANDARDIZED GROUP TEST OF INTELLIGENCE) COULD BE MADE AS A RESULT OF APPROPRIATE MODIFICATIONS OF THE TEACHING-LEARNING ENVIRONMENT TO MEET THE SPECIFIC NEEDS OF DISADVANTAGED PUPILS. DEPRIVED NEGRO PUPILS AND THEIR TEACHERS IN TWO NEW ORLEANS URBAN ELEMENTARY SCHOOLS TOOK PART IN AN EDUCATIONAL IMPROVEMENT PROJECT, INVOLVING A SPECIAL INSTRUCTIONAL PROGRAM. PRELIMINARY TESTING SUPPLIED DEMOGRAPHIC DATA ON BOTH TEACHERS AND PUPILS, NONCOGNITIVE DATA ON TEACHER VARIABLES, AND COGNITIVE DATA ON PUPILS. AT THE PROJECT'S INCEPTION, PUPILS HAD SUCH LEARNER BEHAVIOR CHARACTERISTICS AS DEPRESSED LEARNING POTENTIAL, LOW READINESS LEVELS, INADEQUATE READING SKILLS AND POOR IN-SCHOOL ACHIEVEMENT. THE LONG FORM OF THE CALIFORNIA TEST OF MENTAL MATURITY WAS GIVEN TO ALL (APPROXIMATELY 2,200) PUPILS IN THE FALL OF 1966, PRIOR TO THE INTERVENTION PROGRAM. INTERIM POSTTESTS WERE GIVEN IN THE SPRING OF 1967, AND POSTTESTS WILL BE GIVEN ANNUALLY IN GRADES ONE, THREE, AND FIVE. THERE WERE 305 GRADE ONE, 205 GRADE THREE, AND 250 GRADE FIVE PUPILS PARTICIPATING. ALL GAINS BETWEEN THE PRETESTS AND POSTTESTS IN GRADES ONE, THREE, AND FIVE WERE STATISTICALLY SIGNIFICANT AT OR BEYOND THE .001 LEVEL EXCEPT THE GRADE FIVE NONLANGUAGE GAIN, WHICH WAS SIGNIFICANT AT THE .05 LEVEL. LANGUAGE GAINS WERE HIGHER IN ALL CASES THAN NONLANGUAGE GAINS. THESE PRELIMINARY RESULTS APPEAR TO INDICATE THAT IQ SCORES, AS AN INDEX OF ACADEMIC POTENTIAL, CAN BE IMPROVED SIGNIFICANTLY WHEN GENERAL LEARNING ENVIRONMENT MODIFICATIONS ARE COUPLED WITH INSTRUCTIONAL INTERVENTION PROGRAMS. A DISTINCTION NEEDS TO BE MADE BETWEEN STATISTICAL AND EDUCATIONAL SIGNIFICANCE IN USING DATA TO PLAN OR EVALUATE PROGRAMS. (MS)

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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PRELIMINARY FINDINGS FROM A LONGITUDINAL EDUCATIONAL IMPROVEMENT PROJECT BEING CONDUCTED FOR INSTRUCTIONALLY IMPOVERISHED PUPILS IN INTACT SCHOOLS IN THE URBAN SOUTH

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The New Orleans Education Improvement Project (NOEIP) is one of five[1] urban projects sponsored by the Southern Association of Colleges and Schools (SACS) with funds granted by the Ford Foundation. NOEIP was established as a compact among Dillard University, Tulane University, and the Orleans Parish (New Orleans) School Board. Two elementary (K-6) schools, serving predominantly Negro neighborhoods, were identified for participation in the project. These schools serve pupils whose lack of cultural and educational advantages are manifest in a variety of ways. Between fifty-five and sixty percent of the families live in a low-rent housing project; over fifty percent of the families have an annual income which is below the established "poverty level"; the occupational level of the breadwinner and the educational attainment of the parents are those typically seen under the rubric of low socio-economic status; over 60% of the families are matricentric in composition. The two schools, located within two city blocks of one another, were designed to accommodate a pupil population of about 1500. At the start of NOEIP, the total enrollment in these schools--in grades kindergarten through six--was approximately 2200.

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[1]The other SACS Urban Education Improvement Projects are located in Atlanta, Durham, Huntsville, and Nashville.

The primary purpose of the SACS projects is to provide improved educational opportunities for disadvantaged youth. Approaches to the attainment of this objective vary widely among the Projects[2] with emphases being placed variously on pre-natal observation and research, pre-school education, curriculum development, compensatory education, etc. In NOEIP, it soon became apparent that--in terms both of need and of the conceptual approach of the Project personnel--the central foci would be upon research into the improvement of the teaching-learning process and on the identification and description of differentiated learning and teaching behaviors so that curriculum, learner, and teacher might be most effectively matched.

In order to maintain such an emphasis, NOEIP has been designed in terms of three major emphasis areas. The first of these is DISCOVERY, wherein the primary focus is on the identification and description of the learners (both pupils and teachers) so as to diagnose, most effectively, their levels of functioning as well as their educational needs and problems. The second broad dimension of the Project is DEVELOPMENT. Here, the concentration is on the effective utilization of all available financial and human resources in a variety of educational areas over an extended period of time--leading to the translation of

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[2]Education Improvement Project of the Southern Association of Colleges and Schools. Proceedings: A Status Report on an Action Arm of the Southern Association; Atlanta, Georgia, Fall 1966.

educational and research findings into appropriate materials and procedures in terms of the population being served. The third area of emphasis is DISSEMINATION, through which is communicated (both locally and nationally) what has been learned through the processes of identification, implementation, and evaluation.

It was decided to conduct NOEIP in two intact schools. In this way, the activities and conditions can be replicated elsewhere most effectively and efficiently as the research findings and conclusions of NOEIP warrant such replication. The total population (in-school) comprises an N of some 2200 pupils and some 90 teachers, administrators, and other personnel. Although there was recognition of the need for a wide variety of interventions at the community level, those aspects of the Project designed to serve the non-school population--parents, out-of-school youth and adults, and the community in general--will not be dealt with in this paper.

Preliminary test data were accumulated on both teachers and pupils.[3] These data describe cognitive variables in terms of pupils, non-cognitive variables in terms of the teachers, and demographic data for both groups as well as for the com-

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[3] A full listing of all tests administered may be found in: Plattor, S. D., Second Annual Narrative Report to the Ford Foundation, (mimeo) 1967. A copy of this document may be obtained by writing to the author.

munity being served by NOEIP. At the Project's inception, the pupils displayed those learner behaviors characteristic of academically impoverished children in the urban South--including depressed learning potential, low readiness levels, inadequate reading skills, and poor in-school achievement.

A wide variety of assumptions, objectives, and hypotheses were developed by the Director of NOEIP and his staff. (These, as well, are listed in the Annual Report to the Ford Foundation.) One of the basic premises established--and the one to be reported on in this paper--was that a significant change in the pupils' academic potential (as measured by a standardized group test of intelligence) could be made as a result of appropriate modification of the teaching-learning environment in the Project schools.

In order to assess this facet of our program, the long form of the California Test of Mental Maturity (CTMM) was used. The CTMM provides both a Language and a Non-Language sub-score as well as a total I.Q. Also, it is sufficiently long to provide a reliable measure of factors involved in academic potential. In addition, since scores on the CTMM are scaled to those of the Stanford-Binet--and, therefore, show similar relationships among CA, MA, and I.Q. as does the Stanford-Binet--the test results were equatable with those from a wide variety of other testings.

Pre-testing of all pupils in the two NOEIP schools took place early in the Fall of 1966. The primary purpose of this testing was to provide preliminary base-line data, against which the growth of the participants--during the balance of the Project--could be assessed. Interim post-tests were administered in the Spring of 1967. It was assumed that, since the 1966-67 school year was being viewed as the "pilot" or "tooling-up" phase of the Project, gains would be minimal. These, also, were intended for use as base-line data against which future gains could be measured.

Although the initial pre-tests were administered to all grades K-6, it was decided to post-test the CTMM in grades 1, 3, and 5 only, each year. Tables I, II, and III represent the findings from these testings. As noted, all gains were found to be statistically significant at or beyond the .001 level with the exception of the Grade 5 Non-Language I.Q. gain which was significant at the .05 level. (The emphasis on the statistical significance of the gains was intended to differentiate this from their possible educational significance. This will be discussed briefly later in this paper and will form the major topic of another paper, now in preparation.)

Table I, which depicts the first grade findings, shows an interesting discrepancy between the gains on the Language and

the Non-Language sections of the CTMM. It is further noted that, while this discrepancy is not present as dramatically in grades 3 or 5, the Language gain is higher in all cases than is the Non-Language I.Q. gain.

TABLE I. GRADE 1 CTMM FINDINGS, YEAR 1 (1966-67)

		Fall Testing	Spring Testing	Gain*
Language I.Q.	N	311	311	
	Mean	74.5	85.5	11.0
	S.D.	16.9	17.2	
Non-Language I.Q.	N	316	316	
	Mean	92.2	94.8	2.6
	S.D.	20.4	15.8	
Total I.Q.	N	305	305	
	Mean	84.4	91.5	7.1
	S.D.	16.6	15.8	

*All gains were significant at or beyond the .001 level.

TABLE II. GRADE 3 CTMM FINDINGS, YEAR 1 (1966-67)

		Fall Testing	Spring Testing	Gain*
Language I.Q.	N	206	206	
	Mean	80.0	83.7	3.7
	S.D.	16.1	15.0	
Non-Language I.Q.	N	207	207	
	Mean	91.2	93.7	2.5
	S.D.	14.6	15.5	
Total I.Q.	N	205	205	
	Mean	86.0	89.1	3.1
	S.D.	13.6	15.2	

*All gains were significant at or beyond the .001 level.

TABLE III. GRADE 5 CTMM FINDINGS, 1966-67

		Fall Testing	Spring Testing	Gain*
Language I.Q.	N	262	262	
	Mean	76.8	80.9	4.1
	S.D.	13.8	17.4	
Non-Language I.Q.	N	253	253	
	Mean	85.9	90.7	3.8
	S.D.	16.2	18.1	
Total I.Q.	N	250	250	
	Mean	82.2	86.0	3.8
	S.D.	14.7	17.8	

*All gains were significant at or beyond the .001 level except the Non-Language I.Q. gain which was significant at the .05 level.

It is being hypothesized that the higher Language gains are due, at least in part, to the fact that Non-Language intellectual factors are less amenable to mediation through the cognitive educational approaches generally prevalent in the American elementary school of today. Further, it is assumed that the more dramatic gain on the first grade comparison reflects the higher degree of involvement of those teachers in specially designed in-service activities, as well as the introduction of a wider variety of new teaching materials and approaches at that level. It is this finding which supports the basic premise of this paper--that a significant change in the pupils' academic potential could be made as a result of appropriate modification of the teaching-learning environment in the project schools. This is underscored by Table IV which shows the comparison between a school in which considerable modification was made and a school in which few modifications were made.

An additional item which appears noteworthy from pretesting is that, as the Total I.Q. and Non-Language I.Q. scores increased, the discrepancy[4] between the Language and Non-Language

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[4]Positive discrepancies represent higher Non-Language than Language scores. Negative discrepancies represent the reverse.

scores also increased. Figure 1 provides further insight in regard to this discrepancy factor. Here, the high discrepancy group shows an average Total I.Q. of 87.4. A steady decrease in mean I.Q. in the groups is seen as the group criteria approach negative discrepancy. Thus, the higher the discrepancy the brighter the group. From these figures, it is apparent that it is the brighter youngsters who are the most retarded in language development and it is this same group that would be affected most adversely by limitations on facilities and opportunities to learn. The average Non-Language I.Q. of the high discrepancy group, for example, is approximately 104. The average Language I.Q. for this same group is 71.

In this regard, it has long been a practice of psychologists to use the Non-Language I.Q. as a basic measure when testing people with language handicaps. This practice is substantiated in research findings which indicate high correlation between Language and Non-Language I.Q.'s in the general population. If the same reasoning is applied to these data, it is concluded that the 104 Language I.Q. mean for the highest discrepancy group represents a good estimate of their native intelligence and learning potential, while the Language I.Q. mean of 71 reflects the negative influences of environment, learning opportunities, etc.

VARIABLE 8 (TOTAL I.Q.)

DISCREPANCY RANGES ← : -11 | -10 : -1 | 0 : +10 | +11 : +20 | +20 : →

GROUP 1 | GROUP 2 | GROUP 3 | GROUP 4 | GROUP 5

SPECIAL VALUES

999.= NO SCORE

998.= INVALID

999.000)*********56

998.000)***

TABULATIONS AND COMPUTATIONS WHICH FOLLOW EXCLUDE SPECIAL VALUES

INTERVAL

SCORES	GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5
128.000)					
124.000)			*	*	**
120.000)			*		
116.000)		*	**		**
112.000)				**	****
108.000)		*			*****
104.000)*		*	*	*****	*****
100.000)		**	****	**	********
96.000)*		**	*****	***	*********15
92.000)*		**	****	*********	*********17
88.000)		****	**	*****	*********17
84.000)		*	*******	*****	*********13
80.000)*		*****	**	********	******
76.000)*			**	*******	*********
72.000)		***	******	*********	**********
68.000)*		**	**	*****	********
64.000)*		***	***	**	**********
60.000)*		*	*****	****	**
56.000)***			***	*	***
52.000)*		**	*		*
48.000)		**	***	*	
44.000)		*			
MEAN	73.000	80.182	81.778	83.768	87.445
S DEV	17.378	18.317	19.166	14.972	14.972
N	12.	33.	54.	69.	137.

ALL GROUPS COMBINED (SPECIAL VALUES EXCLUDED)

MEAN	84.2557
S DEV	16.5303
MAXIMUM	127.0000
MINIMUM	47.0000

FIGURE 1 HISTOGRAMS OF CTMM TOTAL I.Q.'S BY VARYING DISCREPANCY LEVELS FOR FIRST GRADE CLASSES.
(FALL TESTING, 1966)

Tables IV and V shows a comparison of the CTMM Language I.Q. gains for first grade pupils in the two NOEIP schools, and the significance of the intra-school gains as well as the comparative gains. A general press toward educational improvement was observed in both schools during the pilot Project year. This may well account for the statistically significant gains shown throughout Tables I, II, and III. In addition to this general press, however, the preponderance of specific instructional interventions were introduced into grade one of School "A". It is noteworthy that the greatest mean gains (in terms of Total I.Q. as well as Language I.Q.) were found in this group of pupils.

The findings described above are seen as an indication that I.Q. scores, as an index of academic potential, are amenable to educationally significant improvement when appropriate modifications are introduced into the learning environment. This improvement is accelerated when the general modifications are accompanied by the introduction of specific instructional interventions geared to the learning requirements of the pupils.

TABLE IV. A COMPARISON OF CTMM LANGUAGE I.Q. GAINS FOR FIRST GRADES OF SCHOOLS "A" AND "B".

School	N	Pre-Test Mean	Pre-Test S.D.	Post-Test Mean	Post-Test S.D.	Gain	p
A	177	74.24	17.3	89.56	18.3	15.32	.001
B	134	74.83	16.6	81.31	16.2	6.48	.001

TABLE V. SIGNIFICANCE OF MEAN GAIN DIFFERENCE BETWEEN SCHOOLS "A" AND "B" FOR THE LANGUAGE SUB-TESTS OF THE CTMM.

School "A" (N=177)		School "B" (N=134)		t	p
Mean Gain	S.D.	Mean Gain	S.D.	School "A" - "B"	
15.32	3.37	6.48	1.28	26.62	.001

The Significance of Significance

Earlier in this paper a reference was made to the need to differentiate between statistical and educational significance. As most researchers are aware (although few publicly admit), the finding of statistical significance is relatively simple--given a sufficiently large N--and is of relatively minimal real importance in educational research. As an example, note--in Table I of this paper--that a growth in Non-Language I.Q. for first grade pupils of 2.6 points (from 92.2 to 94.8), during the course of an academic year, is statistically significant at the .001 level. However, of what practical, instructional significance is such a change? It would be totally fallacious to assume that a pupil--or any group of pupils, regardless of size--with I.Q. of 92.2 requires a different form of education than one with 94.8 because of the I.Q. difference. No matter how significant this difference might be, statistically it is necessary to develop appropriate means of distinguishing between statistical and instructional significance in educational research. Even more important, it is imperative for educators--particularly those who read and act on the results of educational research--to recognize the difference that exists between the two kinds of significance and to design curriculum in terms of educational significance.

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(K-6)